

U.S. Patent Application No. 10/620,269  
Amendment dated June 30, 2008  
Reply to Office Action of January 2, 2008

**JUN 30 2008****REMARKS/ARGUMENTS**

Reconsideration of the above-identified application is respectfully requested. Claims 1-21, 24, and 26-41 are pending. Claims 22, 23 and 25 are canceled. Claim 1 is currently amended.

Claim 1 has been amended with respect to the recited ash content range, such as supported at page 6, lines 20-22, and elsewhere in the present application.

**Industrial Carbon, Medalia and Dee Snell References**

At page 2 of the Office Action, the Examiner indicates that the Industrial Carbon reference, the newly cited Medalia reference, and Dee Snell article reference will apply to all rejections made in the Office Action in certain respects. The Examiner indicates that the Industrial Carbon reference is presented as evidence that as-synthesized carbon blacks meet the 325 mesh limitation, except for the 'poor' grades, and notes also the sulfur values reported as being typical. The Examiner indicates that the Medalia reference has extended discussion and pictures indicating that carbon black has a small particle size and meets the 325 mesh limitation, and that the concluding section teaches 1% ash as conventional. The Examiner also indicates that the iodine and nitrogen are shown to correlate by the Dee Snell article (pg. 186).

The Industrial Carbon, Medalia, and Dee Snell article references are addressed below where applicable in the responses provided to the various rejections made in the most recent Office Action.

**Rejections of Claims 1, 2, 4, 5, 7-11, 26, 28-30, and 34 under 35 U.S.C. §102(b) and §103(a) – van Konynenburg et al. in view of Medalia article and Industrial Carbon**

At page 2 of the most recent Office Action, the Examiner rejects claims 1, 2, 4, 5, 7-11, 26, 28-30, and 34 under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over van Konynenburg et al. (U.S. Patent No. 4,775,778) in view of the newly

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cited Medalia article and Industrial Carbon.

The Examiner essentially rejected the claims in view of similar reasoning as set forth at page 2 of the previous Office Action of September 28, 2006, with several apparent modifications noted as follows. The Examiner presently identifies and relies on entries 8-10 (Vulcan 5H, Regal 330 and Regal 330R carbon blacks) in Table 1 of van Konynenburg et al. *in lieu* of previously identified and relied upon Regal 660 carbon black. At page 5 of the most recent Office Action, the Examiner also states that van Konynenburg teaches a host of carbon materials, and differences should be shown versus all which appear similar, as Applicant, according to the Examiner, is responsible for the content of the reference and not only that which is pointed out by the Examiner. As discussed above, the Examiner also is now understood to cite the Medalia reference as having extended discussion and pictures indicating that carbon black has a small particle size and meets the 325 mesh limitation, and that the concluding section teaches 1% ash as conventional. This rejection is respectfully traversed.

Among other differences recited in the present claims, the carbon blacks of the present invention are characterized by a very low content ash and sulfur as compared to conventional carbon black. There are very strict requirements on the materials that are compounded with polymers in making certain products, such as pressure pipes. These requirements for the pressure pipes, for example, have been defined according to industry knowledge of the factors that affect the drinking water taste and odor, well known in the industry as "organoleptic" properties. These organoleptic requirements have been further translated into one or more of ash, low sulfur impurity, and toluene extract requirements by these regulatory agencies. The carbon blacks of the present invention are high purity materials that can address these and other considerations or regulatory requirements, depending on the product application. Further, compounds containing carbon black

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usually absorb some moisture upon exposure to air. This moisture absorption, or compound moisture absorption (CMA) as it is known in the plastics industry, can create processing problems (e.g., die drool) or surface defects or internal cavities in the finished part. This is due to the migration of entrapped moisture through the compound during the extrusion process of the compound that is not sufficiently dried. The high purity of the inventive carbon blacks can make it possible to reach low CMA levels in the compound. The carbon blacks of the present invention also impart robust UV stability and weatherability to plastics that incorporate them. This beneficial effect is associated at least in part with the specification of a primary particle size of no greater than 25 nm. The carbon blacks also disperse well, such as in polymers, which aids in avoiding the occurrence of undispersed agglomerates that might cause crack failures in polymeric materials made with carbon black. The carbon blacks having the combination of features such as recited in present claim 1, provide an improved balance in terms of performance properties relevant to many applications, such as pressure pipes.

The entries 8-10 in Table 1 of van Konynenburg et al., which are currently referenced and relied upon by the Examiner in making this rejection, do not indicate ash content, sulfur content, 325 mesh residue or iodine values. It is understood that the Examiner is equating the nitrogen surface area ( $N_2$ ) values reported by van Konynenburg et al. with the presently recited iodine number values ( $I_2$  No.) for purposes of this rejection. The applicant still traverses that position. As generally known in the industry, process conditions, such as presence of residual feedstock, oxidation, *etc.*, can lead to discrepancies between nitrogen surface area values and iodine numbers determined for a given carbon black. Further, even assuming the  $N_2$  values for entries 8-10 in Table 1 of van Konynenburg et al. might be numerically similar to values presently claimed as iodine numbers, for sake of argument only, other significant differences still remain and are present to

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distinguish the carbon blacks of the present invention from those of the reference. The Medalia article now cited by the Examiner clearly and unequivocally teaches that a number of prior carbon blacks all had ash content significantly exceeding 0.1%. Reference is made in this respect to carbon black samples #375, RC (Fluffy), N351, N762, N472 and NC in Table 1 on page 489 of the newly cited Medalia article. As indicated in Table 1 of the Medalia article, these prior carbon blacks had original ash contents ranging from 0.27 to 0.92%. These ash contents are approximately 300% higher or more than the ash content specified for the presently claimed carbon black. Therefore, these conventional carbon black values evidenced by Medalia do not anticipate or suggest the higher purity (much lower ash content and sulfur content) carbon blacks of the present invention which are also provided at the prescribed primary particle size range and iodine number value range. The Industrial Carbon reference fails to make up for this difference, as it has nothing to say about ash content or iodine values of carbon blacks. Industrial Carbon refers to sulfur contents that ordinarily can be low as 0.01 to 0.03% but that occasionally values as high as 0.4% are encountered. The reference in Industrial Carbon to carbon black "traces" left on 325 mesh screen (44 micron) on screen analysis, or, in poorer grades, 0.03 to 0.15%, is understood to be an independent parameter from ash content. Also, Industrial Carbon refers to carbon blacks having an estimated diameter of from 60 to less than 20 millimicrons. However, the Industrial Carbon reference nowhere suggests that ash content and iodine values can be predicted from sulfur content, 325 mesh and/or particle sizes that might known for a given carbon black.

For these reasons, as well as the other reasons provided previously, van Konynenburg et al. in view of Industrial Carbon and Medalia does not teach or suggest the claimed invention and both the §102 and §103 rejections should be withdrawn.

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**Rejection of Claim 27 under 35 U.S.C. §103(a) – van Konynenburg et al.**

At page 2 of the most recent Office Action, the Examiner rejects claim 27 under 35 U.S.C. §103(a) as being obvious over van Konynenburg et al.

The Examiner indicates that the reference does not teach the kind of polyethylene claimed, however it teaches the genus. The Examiner states that using the claimed type of PE is an obvious expedient because it meets the requirements of the polymer needed. This rejection is respectfully traversed.

As explained above, meeting the ash content and sulfur content specifications, in combination with the other recited properties, of the presently claimed carbon black is important in order to provide a polymer composition or other application wherein the carbon black can aid the polymer product in achieving enhanced organoleptics, low CMA, dispersion, UV stability and other beneficial performance.

For these reasons, as well as the other reasons provided above in the §102(b) rejection, van Konynenburg et al. does not teach or suggest the invention recited in claim 27 and this §103 rejection should be withdrawn.

**Rejections of Claims 1-21, 24-30, and 34-40 under 35 U.S.C. §102(b) – Sant ('250 patent) or Sant ('251 patent)**

At page 3 of the Office Action, the Examiner rejects claims 1-21, 24-30, and 34-40 under 35 U.S.C. §102(b) as anticipated by Sant (U.S. Patent No. 5,877,250) or Sant (U.S. Patent No. 5,877,251).

In the most recent Office Action, the Examiner states that each reference teaches what appears to be the claimed carbon black. The Examiner states that the present specification, at page 13, indicates that the present carbon black is the same as that of Sant '250 or '251, with no

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modifications made. At page 5 of the most recent Office Action, the Examiner further states that the differences should be demonstrated versus Sant. This rejection is respectfully traversed.

As previously explained in the record, with the reference at page 13 of the present application, the reference to Sant '250 is with respect to the processes that can be used to make "carbon black products" in general. The reference to "carbon black products" at page 13 is simply with respect to the raw materials, as well as the products that can incorporate carbon black, such as the polymer compositions. It is respectfully noted that the term "carbon black products" is referred to when referring to Sant '250 and not the term "carbon blacks." In view of this clarification, Sant '250 does not teach or suggest the carbon blacks of the present invention as set forth, for instance, in claim 1 and the dependent claims. No admission was made that the Sant '250 or '251 patent teaches or suggests the claimed invention.

As further indicated in the previous responses, as well as during the interview conducted with the Examiner on March 22, 2007, Sant '250 and Sant '251 do not teach or suggest an ash content, sulfur content, or a 325 mesh residue as recited in the claims of the present application. The present specification, at page 13, certainly does not suggest that the provision of carbon black meeting all the criteria set forth in claim 1, including the ash content specification, *etc.*, were conventional. Again, the Medalia article demonstrates that the ash content of the present carbon blacks was not possessed by the conventional carbon blacks. Further, there is no teaching, motivation, or prediction of success for one skilled in the art to make the carbon blacks having the particular parameters of claim 1, which include these parameters.

For these reasons, this rejection should be withdrawn.

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**Rejection of Claims 1, 4, 7-9, 25, 26, 29, 30 and 34-36 under 35 U.S.C. §102(b) – Thielen in view of Probst et al., Industrial Carbon, and Medalia Article**

At page 3 of the Office Action, the Examiner rejects claims 1, 4, 7-9, 25, 26, 29, 30, and 34-36 under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Thielen (U.S. Patent No. 5,902,517) in view of Probst et al. (U.S. Patent No. 5,639,817), Industrial Carbon, and Medalia Article.

The Examiner essentially relies on Table 1 of Thielen and the reference to Ensaco 250 carbon black for similar reasons as set forth in the earlier Office Action of September 28, 2006, with the addition that the iodine value appears present due to the general correspondence to nitrogen value. At page 5 of the most recent Office Action, the Examiner further stated that the MMM Technical Bulletin “was not found,” and also referenced Medalia. This rejection is respectfully traversed.

To the extent the Examiner can not locate the MMM Technical Bulletin, attention is kindly directed to the USPTO’s PAIR system records for October 25, 2007, where a copy of the bulletin is recorded and publicly available. It is clear that the document was properly submitted. As explained in the interview conducted with the Examiner on March 22, 2007, the Technical Bulletin from MMM Carbon, the manufacturer of Ensaco 250 carbon black, shows that Ensaco 250 carbon black has an average particle size of 40 nm, which would be outside the particle size recited in claim 1 of the present application (i.e., “no greater than 25 nm”). For this reason alone, this rejection should be withdrawn.

As discussed above, Medalia and Industrial carbon each fails to teach the presently claimed ash content. The applicants further believe that the arguments previously submitted in the Amendment filed July 20, 2006 still apply as well and these comments are incorporated in their entirety by reference herein.

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Accordingly, this rejection should be withdrawn.

**Rejection of Claims 1-21, 26-30, and 34-40 – Non-statutory Obviousness-Type Double Patenting in view of U.S. Patent No. 6,852,790, Industrial Carbon, and Medalia Article**

At pages 3-4 of the most recent Office Action, the Examiner rejects claims 1-21, 26-30, and 34-40 on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over claims 22-53 of U.S. Patent No. 6,852,790, in view of Industrial Carbon and the Medalia Article.

The Examiner indicates that the '790 patent elucidates in col. 3 overlapping particle size, and other properties, and the polymers are indicated in col. 8. The rejection is respectfully traversed.

Applicants respectfully disagree with the Examiner's proposition. The analysis of possible obviousness double patenting is focused on whether "conflicting claims" are present between the instant application and the previously issued patent to assignee, and not whether there may be a conflicting claim when combined with unclaimed specification disclosures, as suggested in the Office Action (e.g., see M.P.E.P. § 804 *et seq.*). Therefore, this obviousness-type double patent rejection is improper.

Accordingly, for these reasons and the reasons set forth in the response filed July 20, 2006 (incorporated herein by reference), this rejection should be withdrawn.

The Examiner also references the Industrial Carbon and Medalia references. However, these references differ from the present claims as explained above, and reference is made thereto, and they would not make up for the differences between the present claims and the claims of the '790 patent.

Furthermore, as explained in the interview, with respect to the Industrial Carbon reference, this reference specifically states that carbon blacks leave traces on the 325 mesh screen and the weight percents can be from 0.03 to 0.15 percent. As pointed out in the interview, 0.03 percent



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equates to 300 ppm, which is outside of the range recited in claim 1, which is a 325 mesh residue of about 200 ppm or less.

For these reasons, this rejection should be withdrawn.

**Rejection of Claims 1-10, 26, 29-33 and 41 – Non-statutory Obviousness-Type Double Patenting in view of U.S. Patent No. 6,482,386, Industrial Carbon, and Medalia Article**

At page 4 of the most recent Office Action, the Examiner rejects claims 1-21, 26-30, and 34-40 on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 6,482,386 in view Industrial Carbon and Medalia Article.

The Examiner indicates that column 4 of the '790 patent teaches a tube shape and fluffy form, which indicates the 325 mesh limitation is met. The rejection is respectfully traversed.

As pointed above, the analysis of possible obviousness double patenting is focused on whether "conflicting claims" are present between the instant application and the previously issued patent to assignee, and not whether there may be a conflicting claim when combined with unclaimed specification disclosures, as suggested in the Final Office Action (e.g., see M.P.E.P. § 804 *et seq.*). Therefore, this obviousness-type double patent rejection is improper.

Accordingly, for these reasons and the reasons set forth in the response filed July 20, 2006 (incorporated herein by reference), this rejection should be withdrawn.

The Examiner also references the Industrial Carbon and Medalia references. However, these references differ from the present claims as explained above, and reference is made thereto, and they would not make up for the differences between the present claims and the claims of the '386 patent.

For these reasons, this rejection should be withdrawn.

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**Rejection of Claims 1-9, 11-17, 19-21, 24-26, 28-29, and 34-36 under 35 U.S.C. §102(b) and §103(a) – Yamazaki et al. in view of Weaver, Dickerson, Industrial Carbon, and Medalia Article**

At page 4 of the most recent Office Action, the Examiner rejects claims 1-9, 11-17, 19-21, 24-26, 28-29, and 34-36 under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Yamazaki et al. (U.S. Patent No. 6,025,429) in view of Weaver et al. (U.S. Patent No. 5,352,289), Dickerson (U.S. Patent No. 4,755,371), Industrial Carbon, and the Medalia Article.

The Examiner essentially rejected the claims in view of similar reasoning as set forth at page 4 of the previous Office Action of September 28, 2006, with the following additions. The Examiner presently states that the particle size is unknown. At page 5 of the most recent Office Action, the Examiner states a difference should be shown in the primary particle size or any other property not explicitly discussed by Yamazaki, and acetylene blacks can have particle sizes within or outside the claimed range. Concerning the JIS versus the ASTM standards, according to the Examiner, 1% ash is 1% ash and it does not matter how it is measured. The rejection is respectfully traversed.

As previously pointed above, the present claims recite, *inter alia*, an ash content of less than 0.1%, not 1%. As also previously discussed, the Medalia article shows that conventional carbon blacks do not teach, suggest, or predict the success of such high purity carbon blacks as presently claimed in terms of the recited ash content and/or sulfur content. The other deficiencies noted in the previous response apply equally here and are sufficient to rebut the rejection.

Accordingly, for at least these above reasons and others set forth in Applicant's previous response, this rejection should be withdrawn.

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**Rejection of Claims 30-33 under 35 U.S.C. §103(a) – Yamazaki et al. in view of Weaver, Dickerson, Industrial Carbon, and Medalia Article**

At page 5 of the most recent Office Action, the Examiner rejects claims 30-33 under 35 U.S.C. §103(a) as obvious over Yamazaki et al. in view of Weaver et al., Dickerson, Industrial Carbon, and the Medalia Article.

According to the Office Action, the references do not teach the claimed pipe, however forming one is an obvious expedient to create a useful artifact made of carbon and polymer with desired properties. The rejection is respectfully traversed.

Claims 30-33 are directed to products that can exploit the low ash content recited in parent claim 1 so as to yield, for example, enhanced organoleptics and CMA properties, such as explained above. As also previously discussed, the Medalia article shows that conventional carbon blacks do not teach, suggest, or predict the success of such high purity carbon blacks as presently claimed in terms of the recited ash content and/or sulfur content.

Accordingly, for at least these above reasons and others set forth in Applicant's previous response, this rejection should be withdrawn.

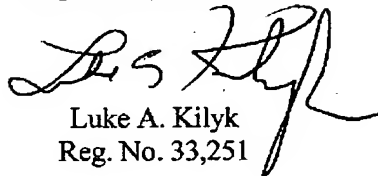
**CONCLUSION**

In view of the foregoing remarks, the applicant respectfully requests the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

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Respectfully submitted,



Luke A. Kilyk  
Reg. No. 33,251

Atty. Docket No. 02077 (3600-395-01)  
KILYK & BOWERSOX, P.L.L.C.  
400 Holiday Court, Suite 102  
Warrenton, VA 20186  
Tel.: (540) 428-1701  
Fax: (540) 428-1720